

**UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

**Aerospace Industries Association &
General Aviation Manufacturers Association**

for an exemption from § 25.1397(a) of Title 14, Code of
Federal Regulations

Regulatory Docket No. 28687

DENIAL OF EXEMPTION

By letter dated August 29, 1996, Mr. Howard Aylesworth, Jr., Director of Airworthiness and Regulation, Aerospace Industries Association, 1250 Eye Street NW, Washington, D.C. 20005-3922, and Mr. William Schultz, Vice President, Engineering & Maintenance, General Aviation Manufacturers Association, petitioned jointly for permanent exemption from the color (chromaticity) requirements of § 25.1397(a) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would expand the color boundaries for red anticollision lights for aircraft in service, in production, and those being certificated.

The petitioner requests relief from the following regulation:

Section 25.1397(a) - Specifies the color (chromaticity) requirements for red position lights.

Related regulation:

Section 25.1401(d) - By reference to 25.1397(a), specifies the color requirements for anticollision lights.

The petitioners' supportive information is as follows:

"In accordance with the requirements of FAR Par 11.25, the Aerospace Industries Association (AIA) and General Aviation Manufacturers Association (GAMA) petition for a permanent Grant of Exemption from the requirements of paragraph 1397(a) of FAR Part 25. This exemption would define certification requirements for aircraft in service, in production and those being certificated. This regulation specifies the color (chromaticity) requirements for red position lights and, by reference to this regulation within paragraph 1401(d) of FAR Part 25, the color requirements for red anticollision lights.

"FAR Part 25.1397(a) requires each position (and therefore also anticollision) light to "have the applicable International Commission on Illumination chromaticity coordinates as follows: (a) Aviation red - 'y' is not greater than 0.335; and 'z' is not greater than 0.002." AIA and GAMA are requesting an exemption from FAR Part 25.1397(a) that would expand the color boundaries for red anticollision lights such that for "(a) Anticollision red - 'y' is not greater than 0.350; and 'z' is not greater than 0.020."

"The following background, technical information, and rationale are provided to support granting of the requested exemption intended primarily for red anticollision lights:

- "1. Anticollision lights may be either red or white. The aviation red color required for red anticollision lights is a highly restrictive color that is intended to be used where the color itself imparts specific information. The color has been selected by international organizations so that it cannot be confused with green or the intermediate color, which in this case is white. The color of anticollision lights does not impart any specific information. Anticollision lights only provide conspicuity. Two problems are created by the unnecessary use of the highly restrictive red color. One problem is that the red filter required to produce the aviation red color from the white light produced by Xenon flash tubes will transmit only about 16 percent of the light. In other words, it takes 2,500 effective candelas of white light to produce 400 effective candelas of aviation red light. The lights must be driven hard to meet the requirements, causing the lights to have a relatively short useful life. The second problem is that since anticollision lights are intended to be conspicuous in the peripheral vision, the longer wavelengths of the restrictive aviation red color are less visible than less restrictive red colors which include shorter wavelengths of light.
- "2. These problems will be significantly reduced by changing the chromaticity boundaries for red anticollision lights from: $y = 0.335$ and $z = 0.002$ to: $y = 0.350$ and $z = 0.020$. The filter required to produce the new anticollision red color can transmit approximately 20 percent of the light. This is a 25 percent increase over the transmission of the aviation red filter. With the new color, 2,000 effective candelas of white light can produce 400 effective candelas of red light. This will significantly increase the life of the light. Also, the shorter wavelengths of light added to the signal by the color filter change will increase conspicuity at the peripheral angles where the anticollision light must be seen.

"The granting of this exemption would be in the public interest and would provide an equivalent and higher level of safety.

"A. Public Interest

Reduced Maintenance Costs -- The increased lens transmission made possible by the change in color will increase the amount by which new lights exceed the intensity specified in the FAR. The increased margin will increase the time that lights can be operated before being serviced, thus reducing unscheduled interruption of normal airline service.

“B. Equivalent and Higher Level of Safety

With regards to increasing the average fleet intensity of red strobe lights, there has been much controversy about the intensity of anticollision lights and statements that in-service intensities are low. This change will allow users to increase in-service intensities.

Raising the "y" chromaticity limit will add shorter wavelengths to the red anticollision light spectrum. At larger peripheral angles the eye is more sensitive to light at shorter wavelengths. Anticollision lights are intended to attract the attention of pilots when scanning for other aircraft. The approaching aircraft may be in the periphery of the pilots' field of view. The higher the sensitivity to the light in the peripheral vision, the higher the probability that an anticollision light in that region will be seen at night. The ratio of rods to cones in the retina of the eye increases with distance from the fovea. Rods have a lower threshold than cones, but they also respond to shorter wavelengths at wider angles than for the red color at the current color limits. This will increase the detectability of the lights with the proposed color limit ($y=.350$) compared to the lights with the aviation red ($y=.335$) limits.

“AIA and GAMA request that FAA give all due consideration to the expeditious processing of this application for exemption, and suggest that FAA may wish to consider a permanent rule change embracing the substance of this petition.

A summary of the petition was published in the Federal Register on December 24, 1996 (61 FR 67868). No comments were received.

The FAA's analysis/summary is as follows:

The FAA has reviewed the petitioners' request for permanent exemption of general applicability from the color (chromaticity) requirements of § 25.1397(a). While the request does have technical merit, the exemption process is intended for individual applicants seeking relief for their individual products. It is not a means to allow for an industry-wide noncompliance with a particular rule. In fact, Department of Transportation policy is very clear on this issue; the FAA will not grant blanket exemptions.

In consideration of the foregoing, I find that a grant of exemption would not be in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), the joint petition of the Aerospace Industries Association and the General Aviation Manufacturers Association for a permanent exemption from the color chromaticity requirements of § 25.1397(a) for red position lights, and by reference within § 25.1401(d), the color requirements for red anticollision lights, is hereby denied.

Issued in Renton, Washington, on June 6, 2000.

/s/ Donald L. Riggin
Acting Manager, Transport Airplane Directorate
Aircraft Certification Service, ANM-100